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AIR CARRIER LIABILITY FOR NUCLEAR DAMAGE*

By EDWIN O. BAILEY†

I. INTRODUCTION

TWENTY-SIX years ago, on 2 December 1942, man first achieved a self-sustaining chain reaction in a crude atomic pile and thereby initiated the controlled release of nuclear energy.¹ Since that day, the beneficial uses of nuclear energy as a source of power to replace fossil fuels and in many other fields have become well-known.² Expectations for the use of the atom in the future seem almost limitless.³ In sum, nuclear energy is and will continue to be a source of great social benefits. Counterpoised to these expectations lies the unknown risk of potentially great harm to the public due to the uncontrolled release of radiation. Estimates of the magnitude of damage which could be caused by a nuclear accident stagger the imagination.⁴

* The views presented are those of the author and do not necessarily reflect the position of the International Air Transport Association.

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¹ *Life with the Atom after Twenty-Five Years*, U.S. NEWS AND WORLD REPORT, Dec. 11, 1967, at 64; for another account of the development of the nuclear energy industry in the United States, see: St. Clair, *Should Foreign or Domestic Law Govern Liability for Damages from Nuclear Incidents in the United States?*, 32 INS. COUNSEL J. 142 (1965).

² In the United States alone, 16 atomic plants are generating power, 20 are being built, and 51 are on the drawing boards. More than 3,000 U.S. hospitals are using more than 30 radioisotopes to prevent disease. U.S. NEWS AND WORLD REPORT, Dec. 11, 1967 at 64.

³ By 1980, one-third of all electric power in the U.S. will come from nuclear energy. Twenty years later, the figure will be fifty per cent. By then, new Breeder reactors will be making fuel at a faster rate than they consume it. Nuclear explosives will be evacuating harbors and canals, and underground explosions will increase the production of natural gas. In the oceans nuclear power will pump up and process mineral wealth. Nuclear ships will harvest food from the seas. De-salted water from the oceans will irrigate the deserts and increase the world's tillable land. In outer space, nuclear powered rockets may carry men to the moon, and help make it habitable. *Id.*

⁴ In 1957, the United States Atomic Energy Commission (AEC) published the *Brookhaven Report* on the possibilities and consequences of accidents in nuclear power plants. According to this report, the likelihood of an accident ranged from "a chance of one in one hundred thousand to one in one thousand million per year of each large reactor." In the case of an accident occurring, "theoretical estimates indicated that personal damage might range, from a lower limit of none injured or killed to an upper limit, in the worst case, of about thirty-four hundred killed and forty-three thousand injured." In the "worst case," property damage could amount to \$7 billion. See generally: United States AEC, REPORT ON THEORETICAL POSSIBILITIES AND CONSEQUENCES OF MAJOR ACCIDENTS IN LARGE NUCLEAR POWER PLANTS (1957); also, Hardy, *International Protection Against Nuclear Risks*, 10 INT'L AND COMP. L.Q. 739, 740-41 (1961). The *Brookhaven* estimates have recently been criticized as being far below the potential damage which might result today from an accident in the considerably larger plants which are now being built. See, HEARINGS ON PROPOSED AMENDMENTS TO PRICE-ANDERSON ACT RELATING TO WAIVER OF DEFENSES BEFORE THE JOINT COMMITTEE ON ATOMIC ENERGY, 89th Cong., 2d Sess. 144, 151 (1966) as cited in *The New Price-Anderson: Is the United States Moving Toward International Agreement on Nuclear Indemnity?*, 7 VA. J. INT'L L. 157 (1966). The possibility of damage being done to food supplies at a distance of 380 miles has also been reported at the 1958 Geneva Conference on the Peaceful Uses of Atomic Energy. Hardy, *Nuclear Liability: The General Principles of Law and Further Proposals*, 36 BRIT. YEAR BOOK INT'L L. 223, 225 (1960). In fact, the *Brookhaven* estimates have yet to be tested by experience. Raney, *The Atom and the Law—Circas*, 1966, 47 CHI. B. REC. 317, 320-21 (1966). Compared to automobile traffic, flying, mining and some other common activities, radiation is a minor hazard. O'Toole, *Radiation, Causation, and Compensation*, 54 GEO. L.J. 751, 754 & 761

This conflict between the expectations and the possible harm from the uses of nuclear energy calls for basic policy answers on the legal principles which should be adopted to regulate and assign responsibility for nuclear damage. For, unless liability principles governing nuclear activity are clear and practical, it is conceivable that the sheer exposure to potentially great losses will stifle private and public endeavor in this field.⁵ In more precise terms, a way must be found to provide realistic financial protection for the public, and, at the same time, permit the young nuclear energy industry and those participating in it to be unfettered by unlimited liability. Moreover, these conditions must be achieved not only in the municipal laws, but also (and perhaps more importantly) in the form of uniform international standards.⁶

Some progress in fulfilling these objectives has already been made in the form of international agreements which attempt to accommodate divergent national interests by establishing minimum standards of financial protection for the public and by setting limits of liability for those responsible within the bounds of available insurance and governmental indemnities. These conventions include the Paris Convention of 29 July 1960, covering Third Party Liability in the Field of Nuclear Energy (hereinafter referred to as the Paris or OECD Convention); the Vienna Convention of 29 April 1963, dealing with Civil Liability for Nuclear Damage (hereinafter referred to as the Vienna or IAEA Convention); and the Draft Conventions of the Inter-American Nuclear Energy Commission (hereinafter referred to as the Draft IANEC Conventions).⁷ None

(1966). In the five-year period, 1957-1961, there were only thirty-one minor nuclear incidents on the "several hundred thousand shipments of radioactive substances in the United States under the jurisdiction of the Atomic Energy Commission." Ely, *Nuclear Liability, Limitations and Indemnification*, 30 INS. COUNSEL J. 2217 (1963). See also, Baldwin, *Changes of Nuclear Mishap Viewed as Infinitesimal*, 8 ATOMIC ENERGY L.J. 21, 28. From 1943 to 1964 in all AEC plants there have been 88 accidental fatalities, only three of which have been attributed to radiation. A total of 7,693 persons were injured in the same period, 36 of them by radiation. BALDWIN, *supra*.

⁵ In searching for the "general principles of law recognized by civilized nations" which would govern nuclear liability, Hardy has concluded as follows: "Applying this test, it is submitted that the principle of strict liability, i.e., liability independent of proof of either intention or negligence, has been adopted in one form or another by all modern legal systems in order to regulate responsibility for the creation of ultra-hazardous risks." He is of the opinion that nuclear activities constitute such risks. Hardy, *Nuclear Liability*, *supra* note 4, at 237. The maximum amount of available commercial insurance in the United States for nuclear incidents was \$74 million as of 1 Jan. 1966. H.R. REP. NO. 883, 89th Cong., 1st Sess. 11 (1965), as cited in *The New Price-Anderson*, *supra* note 4, at 164. The private insurance companies in Latin America may not be able to cover risks of more than \$1 million (U.S.). REPORT OF THE SPECIAL LEGAL COMMITTEE ON CIVIL LIABILITY IN THE FIELD OF NUCLEAR ENERGY, Inter-American Nuclear Energy Commission, 37 (1967).

⁶ The importance of uniform or harmonious national laws on nuclear liability and indemnity is underscored by the numerous international arrangements which already exist amongst states for cooperation in nuclear research, establishment of nuclear installations and in the supplying of nuclear materials. It has been calculated that the United States alone will provide goods between one and one-half billion dollars to several European states engaged in nuclear research before 1970. Hardy, *Nuclear Liability*, *supra* note 4, at 224. See also, Gorove, *Controls Over Atoms-for-Peace: U.S. Bilateral Agreements with Other Nations*, 4 COLUM. J. TRANSNAT. L. 181 (1966).

⁷ The Paris Convention, including the Supplementary Convention of 31 Jan. 1963, to the Paris Convention of 29 July 1960, incorporating the provisions of the Additional Protocol signed in Paris on 28 Jan. 1964, and the Draft Conventions of the Inter-American Nuclear Energy Commission may be found in the REPORT OF SPECIAL LEGAL COMMITTEE ON CIVIL LIABILITY IN THE FIELD OF NUCLEAR ENERGY, Inter-American Nuclear Energy Commission, at 131, 155, 71 and 87. Sixteen European States signed the Paris Convention on 29 July 1960, and as of 7 Aug. 1967, the OECD had received the ratifications of Turkey, Spain, the United Kingdom, France and Bel-

of these are as yet in force, but both Paris and Vienna are expected to reach this stage in the near future.⁸ All of these conventions (which, unfortunately, are not entirely compatible) extend to the area of liability of air carriers for nuclear damage caused during the transportation of the sources of nuclear energy.⁹ This raises the specter of conflict with existing and contemplated treaties governing air carrier liability, e.g., the Warsaw Convention and that Convention as amended by the Hague Protocol (and the 1966 inter-carrier agreement on personal liability), the Rome Convention of 1952, and the draft Collisions Convention.¹⁰ It is also conceivable that the nuclear liability treaties have not covered all aspects of this type of air carrier liability, either through oversight, design, or choice of language.

This paper will examine the substantive and adjectival law of the nuclear liability conventions insofar as it pertains to air carrier liability for the carriage of nuclear materials. Special attention is given to provisions which may, either directly or indirectly, result in unusual air carrier liability under the conventions or in spite of the conventions and under the municipal laws of the various contracting parties. Recommendations are made on (1) how the conventions might be amended in the interests of air carriers, and (2) how air carriers may take measures to protect themselves until changes in the conventions are instituted. A topical

gium. The Treaty will come into effect when five States have also ratified the Additional Protocol of 28 Jan. 1964. Of the five States which have ratified the Agreement, only Turkey has not accepted the Protocol. Source: Legal Department, OECD, Paris. See also, NUCLEAR LEGISLATIONS, ANALYTICAL STUDY, NUCLEAR THIRD PARTY LIABILITY, European Nuclear Energy Agency, OECD, 8 (1967). The IANEC Drafts will not be submitted to a diplomatic conference until the Vienna Convention goes into force and has been ratified by a "reasonable number of American States." REPORT OF THE SPECIAL COMMITTEE, *supra*, at 69. The text of the Vienna Convention appears at page 109 of the report. Although fifty-eight States were represented at the Diplomatic Conference on 20 May 1963, only China, Colombia, the Philippines, Yugoslavia, Spain, the United Kingdom, Cuba, the United Arab Republic, and Argentina signed the treaty. Cuba, the United Arab Republic, the Philippines, and Argentina have ratified the Convention. It will come into effect three months after the deposit of the fifth instrument of ratification. Letter from Mr. Werner Boulanger, Director, Legal Division, IAEA, Vienna, dated 31 July 1967.

⁸ The Vienna Convention is open to accession by all members of the United Nations, any State which is a member of any of the United Nations Specialized Agencies, or any State which is a member of the International Atomic Energy Agency and was not represented at the International Conference on Civil Liability for Nuclear Damage which drafted the Vienna Convention. The Paris Convention (and the Supplementary Convention thereto) is regional in nature and is open to accession of right only by members or associates of the Organization for Economic Cooperation and Development. While any other nation may accede to the Paris Convention, such accession is predicated upon the unanimous assent of the Contracting Parties. The draft IANEC Conventions relate to the Organization of American States, and accession thereto is limited to the American States.

⁹ For a general discussion and comparison of these conventions, See, Cigoj, *International Regulation of Civil Liability for Nuclear Risks*, 14 INT'L & COMP. L.Q. 809 (1965).

¹⁰ The Convention for the Unification of Certain Rules Relating to International Carriage by Air, Warsaw, 12 Oct. 1929, as amended at The Hague, 1955; Agreement Relating to Liability Limitations of the Warsaw Convention and the Hague Protocol, CAB Docket No. 17325, CAB Order No. E-23680 (13 May 1966); The Convention on Damage Caused by Foreign Aircraft to Third Parties on the Surface, Rome, 7 Oct. 1952; the draft Convention on Aerial Collisions, ICAO Doc. No. 8444-LC/151, reprinted in 30 J. AIR L. & COM. 385 (1964). The 1966 Inter-carrier Agreement is reprinted in 33 J. AIR L. & COM. 150 (1967). A comparison of the Paris and Vienna Conventions with the private air law conventions is made by Cabranes, *Limitations of Liability in International Air Law: The Warsaw and Rome Conventions Reconsidered*, 15 INT'L & COMP. L.Q. 660, 679-83 (1966). The United States Atomic Energy Commission apparently does not keep lists of the number of nuclear incidents involving air transportation. The United States Defense Department, on the other hand, has a list of 12 "major" accidents involving air carriage of nuclear weapons and at least four additional such incidents have been publicly reported. BALDWIN, *supra* note 4, at 21.

approach has been chosen owing to the complexity of the conventions and the number of separate matters of legal interest which they cover.

II. THE DESIGN OF THE CONVENTIONS

Before commencing a detailed analysis of the various provisions of the conventions which relate to air carrier liability, it may be instructive for the reader to consider in general terms the basic design and scope of the legal regimes which they would create. All of the agreements are predicated on two objectives: (1) protecting the nuclear energy industry from liability which it is not financially capable of assuming, and (2) providing realistic financial indemnification of the public for loss due to a nuclear incident.¹¹ According to the drafters, these objectives may best be met by channelling all liability for nuclear damage to the operator of a nuclear installation who is required to be financially able to meet this liability up to the limits established in the conventions.

A. Operators And Operations Delineated

The "operator of a nuclear installation" is defined for this purpose as "the person designated or recognized by the Installation State as the operator of that installation."¹² The operator's liability extends to damage

¹¹ The Preamble of the Paris Convention of 29 July 1960 provides for "unifying the basic rules applying to the various countries to the liability incurred for such damage, whilst leaving these countries free to take, on a national basis, any additional measures which they deem appropriate" by "insuring adequate and equitable compensation for persons who suffer damage caused by nuclear incidents, whilst taking the necessary steps to ensure that the development of the production and uses of nuclear energy for peaceful purposes is not thereby hindered." The preambles to the other Conventions are less explicit. The Vienna Convention only mentions "the desirability of establishing some minimum standards to provide financial protection against damage resulting from certain peaceful uses of nuclear energy." For this reason, some commentators seem to have the idea that there is a distinction between the purposes of the Paris and the other conventions. See, e.g., *The New Price-Anderson*, *supra* note 4, at 159. A comparison of the substantive matter of the conventions, however, would not seem to support this view.

¹² Vienna Convention, art. I(1)(c); Paris Convention, art. 1(a)(vi); IANEC Drafts are the same as Vienna. "Nuclear Incident" in Vienna is defined as "any occurrence or series of occurrences having the same origin which causes nuclear damage." Vienna Convention, art. I(1)(l). The IANEC Drafts employ the Vienna language. The Paris Convention definition of "Nuclear Incident" is somewhat broader and incorporates, in some measure, a definition of "Nuclear Damage": "any occurrence or succession of occurrences having the same origin which causes damage, provided that such occurrence or succession of occurrences, or any of the damage caused arises out of or results from the radioactive properties, or a combination of radioactive properties with toxic, explosive, or other hazardous properties of nuclear fuel or radioactive products or waste or with any of them." Paris Convention, art. I(a)(l). The Vienna Convention defines "Nuclear Damage" as: "(i) loss of life, any personal injury or any loss of, or damage to, property which arises out of or results from the radioactive properties or a combination of radioactive properties with toxic, explosive, or other hazardous properties of nuclear fuel or radioactive products or waste in, or of nuclear material coming from, originating in, or sent to, a nuclear installation; (ii) any other loss or damage so arising or resulting if and to the extent that the law of the competent court so provides; and (iii) if the law of the Installation State so provides, loss of life, any personal injury or any loss of, or damage to, property which arises out of or results from other ionizing radiation emitted by any other source of radiation inside a nuclear installation." Vienna Convention, art. I(1)(k). The IANEC Drafts use the Vienna definition of "Nuclear Damage." The Paris Convention does not define "Nuclear Damage" as such; however, art. 3(c) is the same as Vienna Convention, art. I(1)(k)(iii). A "Nuclear Installation" under the Vienna Convention is: "(i) any nuclear reactor other than one with which a means of sea or air transport is equipped for use as a source of power, whether for propulsion thereof or for any other purpose; (ii) any factory using nuclear fuel for the production of nuclear material, or any factory for the processing of nuclear material, including any factory for the reprocessing of irradiated nuclear fuel; and (iii) any facility where nuclear material is stored, other than storage incidental to the carriage of such material; provided that the

caused at the installation as well as during the transportation of nuclear goods to or from the installation. Damage due to ionizing radiation is not included in the conventions as written, but States are permitted to hold the operator liable for such damage under their national laws.¹³ Contracting Parties are also permitted to enact legislation in accordance with which a carrier transporting nuclear material may be designated or recognized as the "operator" of a nuclear installation. Should this happen, the carrier would be considered for all purposes under the conventions as an operator of a nuclear installation situated within the territory of the designating Contracting Party.¹⁴

B. Theory Of Liability

The liability imposed upon the operator of a nuclear installation is absolute—the claimant is not required to prove fault. His only burden is to show that the damage was caused by the nuclear incident.¹⁵ There may be, however, specific exceptions to the operator's liability. He may be exonerated upon proof that the damage resulted from an "act or omission" of the claimant performed with the intent to cause the damage.¹⁶ (In this respect, the liability of the operator of a nuclear installation resembles that of the operator of an aircraft under the terms of the Rome Convention of 1952.¹⁷) This release from liability is not guaranteed by the conventions, however, and will be granted only if the law of a competent court so prescribes. In the absence of a contrary national law, the operator may also avoid liability under the terms of the conventions in the case where the damage was due to a nuclear incident directly caused by a "grave natural disaster of an exceptional character."¹⁸ Furthermore, the operator is released from liability for nuclear damage caused by war and insurrection, regardless of local law.¹⁹

Installation State may determine that several nuclear installations of one operator which are located at the same site shall be considered as a single nuclear installation." Vienna Convention, art. I(1)(j). The IANEC Drafts are identical. The Paris definition of "Nuclear Installation" differs from that in the other conventions only to the extent that the Steering Committee of the European Nuclear Energy Agency has the power to designate "other installations in which there are nuclear fuel or radioactive products or waste" as it shall determine from time to time. Paris Convention, art. 1(a)(ii).

¹³ Vienna Convention, art. I(1)(k)(iii); IANEC Drafts are the same as Vienna; Paris Convention, art. 3(c) and *Preamble*.

¹⁴ Vienna Convention, art. II(2); Paris Convention, art. 4(d); IANEC Drafts are identical to Vienna. The provision in the Paris Convention was inserted at the insistence of the Italian delegation; See, Note by the Secretariat for the Meeting of Government Experts, on 7 Dec. 1959, SEN (59) 83, at 3, Paris, 4 Nov. 1959.

¹⁵ "The liability of the operator for nuclear damage under this convention shall be absolute." Vienna Convention, art. IV(1); IANEC Drafts are identical. The Paris Convention does not use the term "absolute" in describing the operator's liability; nevertheless, the operator's responsibility is the same as that in the other conventions. Paris Convention, art. 3(a).

¹⁶ Vienna Convention, art. IV(2); IANEC Drafts are almost identical to Vienna; the Paris Convention differs from the others in that the operator may not be exonerated where the damage was caused by the gross negligence of the person suffering the damage. Paris Convention, art. 6(f) and (g). While the operator would be exonerated with respect to these particular claimants, he would continue to be liable to non-culpable persons through doctrine of "channelling."

¹⁷ Rome Convention, art. 12(i).

¹⁸ Vienna Convention, art. IV(3)(b); IANEC Drafts are identical to Vienna; Paris Convention, art. 9.

¹⁹ Vienna Convention, art. IV(3)(a); IANEC Drafts are identical to Vienna; Paris Convention, art. 9.

In sum, the operator's liability may be described as independent of culpability. In this respect it resembles that which has been adopted in one form or another by most modern legal systems for the purpose of assigning responsibility for the creation of ultra-hazardous risks²⁰ (particularly in the United States and in many nations in Europe).²¹ Although claimants need only prove damage and cause-in-fact, the operator is given limited recourse rights against other persons in several instances: (1) where the claimant's act or omission with intent to cause damage caused the nuclear incident, and (2) where the right of recourse is given to the operator expressly by contract.²²

C. Minimum And Maximum Limitations Of Liability

The assignment of public responsibility to the operator of a nuclear installation meets one of the objectives of the conventions. The second is achieved by a limitation of that liability. Thus, while the public is protected from activities involving the peaceful uses of nuclear energy, the amount of this protection is finite and not contingent, thereby permitting endeavours in the field to proceed unimpeded. Under the Paris Convention, the operator's maximum liability with respect to damage caused by a

²⁰ Hardy, *Nuclear Liability*, *supra* note 4, at 237. The United States RESTATEMENT OF TORTS, § 519, reads: "one who carries on an ultra-hazardous activity is liable to another whose person, land or chattels the author should recognize as likely to be harmed by the unpreventable miscarriage of the activity for harm resulting thereto, from that which makes the activity ultra-hazardous, although the utmost care is exercised to prevent the harm." An activity is "ultra-hazardous" under the RESTATEMENT "if it (a) necessarily involves a risk of serious harm to the person, land or chattels of others which cannot be eliminated by the exercise of the utmost care, and (b) is not a matter of common usage." RESTATEMENT OF TORTS, Vol. 3, §§ 519-20 (1948).

²¹ For a comparison of national laws on liability for nuclear damage caused by nuclear incidents, see, *Nuclear Liability Legislation in the United States and Europe*, 13 STAN. L. REV. 865 (1961). Nine nations have statutes governing liability for nuclear damage: Austria, Germany, Italy, Japan, Spain, Sweden, Switzerland, the United Kingdom, and the United States. For a recent introduction to the Austrian law, see, Moser, Gantt, Ettinger & Breslauer, *The Austrian Law on Liability for Damages Caused by Atomic Energy*, 26 FED. B.J. 280 (1966). The new amendments to the *Price-Anderson Act* in the United States under which operators of nuclear installations waive certain defences are explained in *The New Price-Anderson*, *supra* note 4, and Trosten & England, *Waiving Refenses: A New Approach to Protecting the Public Against Financial Loss From Use of Atomic Energy*, 27 FED. B.J. 27 (1967). It is interesting to note that the Vienna Conference debates indicated the feeling that even though selection of the liable party was to a certain extent arbitrary, a decision which would require operators, suppliers and others to insure would cause wasteful pyramiding of insurance in an industry which had little experience upon which to base ratings and premiums. *The New Price-Anderson*, *supra* note 4, at 161. The *Report of the Special Legal Committee on Civil Liability in the Field of Nuclear Energy* of the IANEC does not indicate a conflict of opinions on whether liability should be "channelled" solely to the operator. Finally, insurance considerations seem to have weighed heavily on the decision of the European Nuclear Energy Agency of the OECD when it decided that the operator should be solely liable. SEN (59) 79, European Nuclear Energy Agency, OECD, Paris, 23 Oct. 1959. The *Exposé des Motifs* to the Paris Convention also suggest that the channelling of liability to the operator of a nuclear installation was prompted by the desire to avoid "difficult and lengthy questions of complicated legal cross-actions to establish in individual cases who is legally liable." *Paris, Exposé des Motifs*, ¶ 15.

²² Vienna Convention, art. X; Paris Convention, art. 6(f). The IANEC Drafts contain alternative provisions for rights of recourse. The first alternative is identical to the Vienna Convention language. The second would provide recourse against third parties: "The operator shall have a right of recourse against any person who has manufactured materials or equipment for, or who has furnished materials, equipment and services in connection with the design, construction, repair or operation of a nuclear installation, or who has transported or stored nuclear material, for fault of such person." The IAEA Official Records indicate that the Vienna Conference discussed the possibility of recourse against suppliers, but rejected it on the grounds that it would be virtually impossible to identify the faulty component which had caused the damage. See IAEA Official Records 135-38, 293-302.

nuclear incident is 15 million European Monetary Agreement Units of Account (United States dollars), unless States by legislation wish to provide for a higher amount. In no event, however, may an operator's liability be less than 5 million Units of Account.²³ The Paris Supplementary Convention requires national coverage to \$70 million, with an additional \$50 million to be made available from an international pool.²⁴ In contrast with the Paris scheme, the Vienna Convention establishes only a minimum limit of liability of \$5 million for any one nuclear incident.²⁵ The IANEC Drafts also only mention a minimum figure, but the dollar amount will be decided at a future diplomatic conference.²⁶ Both the Vienna Convention and the IANEC Drafts require the Installation State to insure the payment of claims for compensation for nuclear damage to the extent that the operator's own insurance is not adequate to cover such claims, but not in excess of the minimum limits established by the conventions. The Paris Convention does not contain such a provision, but the Supplementary Convention would seem to presume that States would guarantee at least the minimum limitation under Paris.²⁷

D. *Extinguishing Causes Of Action*

Because of the peculiar and often delayed manifestation of radiation injury, the conventions provide for relatively long periods of time before the right to bring suit is extinguished. Under Vienna and the IANEC Drafts, actions may be brought up to ten years from the date of the incident, unless the Installation State provides a longer period to accord with the operator's insurance coverage.²⁸ Paris establishes a comparable period of time. In addition to this allowance, Paris permits Installation States to legislate an extinguishment period of not less than two years from the date on which the claimant had knowledge or should have had knowledge about the damage upon which the claim is based. Under Vienna and the IANEC Drafts, Installation States may provide for a period of not less than three years for the same circumstances.²⁹ Where the nuclear damage is caused by a nuclear incident involving nuclear goods which were stolen, lost, jettisoned, or abandoned, the period under all of the

²³ Paris Convention, art. 7 (a), (b) and (g).

²⁴ Convention Supplementary to the Paris Convention, art. 3 (a), (b). See, Book Review, 16 INT'L & COMP. L.Q. 164 (1967).

²⁵ Vienna Convention, art. V(i).

²⁶ IANEC Draft "A," art. V(i) (4) (5) (6); Draft "B," art. 4 (i) (4) (5) (6).

²⁷ Vienna Convention, art. VII (i) (2); IANEC Drafts are virtually identical to the Vienna provisions; Paris Convention, art. 10 (a) (b) (c). Supplementary Convention, art. 3 (a) (b) (c). *The Price-Anderson Act* in the United States provides for governmental indemnity up to amounts of \$500 million in excess of the private insurance required for each incident. 42 U.S.C. § 2210 (c) (Supp. 1, 1965) as amended 13 Oct. 1966, by Pub. L. 89-645, 80 Stat. 891. The United States representatives at the Vienna Conference took the view that the liability limits established in the convention were unrealistically low in view of the potential damage which might be caused by a nuclear incident. For this reason, several writers have doubted whether the United States can participate in the Vienna Convention. See, e.g., Cavers, *Improving Financial Protection of the Public Against the Hazards of Nuclear Power*, 77 HARV. L. REV. 644, 680-82 (1964); *The New Price-Anderson*, *supra* note 4, at 162.

²⁸ Vienna Convention, art. VI (1); IANEC Drafts employ identical language.

²⁹ Vienna Convention, art. VI (3); IANEC Drafts use the same language as Vienna; Paris Convention, art. 8 (a) (c).

conventions may extend for a period of twenty years from the date of the incident.³⁰

E. Jurisdiction

A final distinguishing aspect of the design of the conventions should be mentioned. This aspect is the matter of jurisdiction over actions arising under the conventions. In most cases, the courts of the Contracting Party within whose territory the nuclear incident occurred have jurisdiction over the actions.³¹ In this respect, the conventions look to the simplicity of the Rome Convention of 1952, rather than the complexity created by the numerous jurisdictions of the Warsaw Convention.³² If, however, the incident occurred outside the territory of a Contracting State, or, if the place of the incident cannot be determined with certainty, jurisdiction lies with the court of the Installation State of the "operator liable."³³

III. LIABILITY OF AIR CARRIERS FOR NUCLEAR DAMAGE OCCURRING DURING THE CARRIAGE OF NUCLEAR GOODS

As in the case of suppliers, repairmen, and other contractors dealing with the operator of a nuclear installation, air carriers also benefit from the exoneration from liability which the conventions afford through the doctrine of "channelling" liability to the operator. But, because treaties governing air carrier liability already are in existence and in force, and for other reasons which will be noted below, air carriers may still be directly liable for damage caused by a nuclear incident during the transportation of nuclear materials in certain instances.³⁴

A. Liability Of The Operator Of A Nuclear Installation For Damage Caused During The Air Carriage Of Nuclear Goods

In keeping with the design of the conventions, the operator of a nuclear installation is primarily responsible for harm to third parties which may

³⁰ Vienna Convention, art. VI(2); Paris Convention, art. 8(b); The IANEC Drafts are identical to the Vienna language.

³¹ Vienna Convention, art. XI(1); IANEC adopt the Vienna language; Paris Convention, art. 13(a).

³² Rome Convention, art. 20(1); Warsaw Convention, art. 28(1).

³³ Vienna Convention, art. XI(2); IANEC Drafts are identical to the Vienna language; Paris Convention, art. 13(b). The conventions also provide for settling disputes where jurisdiction would lie with the courts of more than one Contracting State. Vienna Convention, art. XI(3)(a)(b); Paris Convention, art. 13(c)(i)(ii). The IANEC Drafts go so far as to establish an arbitration procedure in the event that a dispute over jurisdiction cannot be settled within three months from the date of discovery of a plurality of jurisdictions. IANEC "A," art. XI(3)(b); Draft "B," art. 7.

³⁴ In the absence of special contractual arrangements dealing with ultimate liability, the present situation of the common law would normally find the carrier of goods liable for damage caused to third parties. *Paris Convention, Exposé des Motifs*, § 22. In the United States, the liability for incidents occurring during the course of transportation is, under the Price-Anderson amendments, dependent upon local or the common law of the various states within the United States. In the few reported cases where third parties have attempted to hold carriers (not air carriers) strictly liable for the damage caused by hazardous cargo, the courts have denied such liability. See, e.g., *Fidelity and Deposit Company v. Lehigh Valley R.R.*, 275 F. 922 (3d Cir. 1921) (fire in freight yard leading to explosion of thirty-three carloads of munitions) as cited in *Nuclear Liability Legislation*, *supra* note 21, at 877-78. There is at present no special legislation in Canada on third party liability in the field of nuclear energy. *Nuclear Legislations*, *supra* note 7, at 23.

occur during the transportation of the sources of nuclear energy to or from his installation. The problem under the conventions is to decide which operator, the consignor or the consignee, is liable. In principle, the conventions have imposed the liability on the operator who would most likely be responsible for the packing and containment of the nuclear substances, that is, the sending or consigning operator.³⁵ The consigning operator would also be in a better position to insure that the consignments comply with the health and safety regulations laid down for transport.³⁶

All of the conventions follow the same pattern in stating the operator's liability for the carriage of nuclear materials.³⁷ Where the consignee is another operator of a nuclear installation in a Contracting State, the consigning operator remains liable until the consignee has "taken charge" of the nuclear substances.³⁸ If, however, the materials are consigned to a destination in a non-Contracting State, the rules governing the consignor-operator's liability change because the conventions do not impose liability upon persons not subject to the jurisdiction of the Contracting Parties.³⁹

³⁵ *Paris, Exposé des Motifs*, § 23. The Paris Convention uses the term "nuclear substances" to describe the nuclear goods which are carried; Vienna, on the other hand, employs the term "nuclear materials." Paris Convention, art. 1(a)(v); Vienna Convention, art. 1(1)(h). The IANEC Drafts follow the Vienna language. Basically, the terms have the same meaning and include nuclear fuel (other than natural uranium and depleted uranium) and radioactive products or waste.

³⁶ The *Exposé des Motifs* to the Paris Convention offer the following additional reasons for holding the operator of a nuclear installation rather than the carrier liable: "It would seem normal, in the case of transport, for the carrier to be the person liable . . . however, in the case of radioactive materials, very special considerations are involved. The carrier will generally not be in a position to verify the precautions in packing and containment taken by the person sending the materials. Moreover, if the carrier is to be liable he will have to obtain the necessary insurance coverage in respect of potential high liability, and this would result in increased transport charges for the operator. Transport insurance ordinarily covers only the value of the goods transported, i.e., their loss or destruction, and does not extend to damage which such goods may cause to third persons." Interestingly enough, certain insurers have taken the position that the carriers is tantamount to a third party in relation to the operator and that the carrier should not, therefore, be permitted to seek indemnification or have an immunity if it had assumed the risk of carrying nuclear materials. Others, also representing insurance groups, have taken the view that if the proper protection of the public is to be the real object of the exercise, then the most effective underwriting and the maximum insurance coverage could be obtained only if one single line of the whole risk were underwritten, other than splitting underwriters' commitments to cargo, the carrying vehicle, and other carrier liabilities. SEN (59) 79, European Nuclear Energy Agency, OECD, Paris, 23 Oct. 1959.

³⁷ Vienna Convention, art. II(1)(b)(ii); Paris Convention, art. 4(a)(ii); the IANEC Drafts are the same as the Vienna Convention, with certain exceptions which will be noted below.

³⁸ Vienna Convention, art. II(1)(b)(ii); Paris Convention, art. 4(a)(ii); the IANEC drafts would not apply in this case if the consignor were subject to the IANEC Convention and the consignee were subject to Vienna. IANEC Draft "A," art. II(1); Draft "B," art. 3. All of the conventions provide that the consignee may assume liability under these circumstances at another time pursuant to the express terms of a contract in writing. Vienna Convention, art. II(1)(b)(i); Paris Convention, art. 4(a)(i). The conventions also stipulate that where the nuclear substances or material are "intended to be used in a nuclear reactor with which a means of transport is equipped for use as a source of power, either for propulsion thereof or for any other purpose," the consigning operator remains liable until the "person duly authorized to operate such reactor has taken charge" of the nuclear material or substances. Vienna Convention, art. II(1)(b)(iii); Paris Convention, art. 4(a)(iii).

³⁹ Paris Convention, art. 2 reads: "This convention does not apply to nuclear incidents occurring in the territory of non-Contracting States or to damage suffered in such territory, unless otherwise provided by the legislation of the Contracting Party in whose territory the nuclear installation of the operator liable is situated, and except in regard to rights referred to in Art. 6(e)." The Vienna Convention does not include a comparable provision, nor do the IANEC Drafts. The concern of the IANEC and IAEA seems to be with conflict of conventions, rather than the conflict between the conventions and the law of non-Contracting States. REPORT OF THE SPECIAL LEGAL COMMITTEE, *supra* note 5, at 65. The absence of a provision comparable to art. 2 of Paris in both the IANEC

In this case, the conventions provide that the liability of the sending operator would end when the materials have been unloaded from the means of carriage by which they have been transported into the territory of a non-Contracting State.⁴⁰ It should be noted that there is an inconsistency between the theory that the conventions apply to the territory of the Contracting Parties and the just-mentioned provisions which would hold the consignor-operator liable for a nuclear incident until the materials have been unloaded from the means of transport by which they have arrived in the territory of a non-Contracting State.⁴¹ This inconsistency is partially neutralized by an exception which grants certain carriers rights of recourse against operators where the incident occurred in the territory of a non-Contracting State.⁴² More will be said about these recourse rights below.

Because the conventions would prefer to hold the sending operator liable, that operator will have, in the event of a lawsuit, the burden of showing that some other operator had actually taken charge of the nuclear substances.⁴³ The operative phrase "has taken charge of" as used in the conventions would normally be construed by the competent court;⁴⁴ however, nothing in the conventions precludes the Contracting Parties from making requirements which "deem" that the operators of nuclear installations for whom substances are carried from abroad "take the substances in charge" the moment they have reached their territories.⁴⁵

In the case where the nuclear materials are sent from the territory of a non-Contracting State, the operator-consignee becomes liable under the conventions only after the nuclear materials have been "loaded" on the means of transport by which they are to be carried from that territory. The rationale of the conventions in thus extending the operator-consignee's liability is to provide that there will always be someone liable within the territory of one of the Contracting Parties.⁴⁶ Again, there seems to be an inconsistency between the apparent geographical or jurisdictional

Drafts and Vienna does not imply that the latter apply to nuclear incidents occurring in the territory of non-Contracting States.

⁴⁰ Vienna Convention, art. II(1)(b)(iv); Paris Convention, art. 4(a)(iv).

⁴¹ The term "territory" as used in the conventions includes the territorial waters of states. See, *Paris Convention, Exposé des Motifs*, § 7. While the conventions do not apply to nuclear incidents occurring in the territory of a non-Contracting State, or to damage suffered in that territory, national legislation may provide otherwise. *Id.*

⁴² Vienna Convention, art. IX(2)(a); Paris Convention, art. 6(e); IANEC Drafts are the same as Vienna. *Paris, Exposé des Motifs*, § 7.

⁴³ Vienna Convention, art. II(1)(c)(ii); IANEC Drafts are identical to the Vienna Convention; Paris Convention, arts. 3(a) & 4(b)(ii).

⁴⁴ *Paris, Exposé des Motifs*, § 24.

⁴⁵ *Id.*, § 31. Such legislation may be expected in the case where the sending party has a person operating a nuclear reactor with which a means of transport is equipped for use as a source of propulsion; Vienna Convention, art. II(1)(c)(iii); IANEC Drafts are identical to the Vienna Convention; Paris Convention, art. 4(b)(iii). Or where special written contractual arrangements are in effect for the carriage. Vienna Convention, art. II(1)(c)(i); IANEC Drafts are identical to Vienna; Paris Convention, art. 4(b)(i).

⁴⁶ Vienna Convention, art. II(1)(c)(iv); IANEC Drafts are identical to Vienna; Paris Convention, art. 3(b)(iv); *Paris, Exposé des Motifs*, § 26. It is interesting to note that the liability in this case is imposed upon the operator for whom the materials are destined, only when he has given his prior written consent to the sending of the materials. It is precisely this kind of detail which air carriers must be aware of in order to gain any benefits of immunity from liability under these conventions.

scope of the operator's liability and the purported design of the conventions which hold that they would not apply to incidents or damage occurring in the territory of a non-Contracting State. If the incident occurred after loading but before the materials were actually outside of the territory of a non-Contracting State, it is difficult to see how carriers could assert that the law governing the accident was that provided by the conventions.⁴⁷ (At best, carriers would have to rely on the limited recourse actions which the conventions permit against the operator, which will be discussed more fully below.⁴⁸)

⁴⁷ For a review of the conflicting principles which both civil and common law courts may apply if an incident involving a signatory occurs outside of the territory of the Contracting States, see, *Nuclear Liability Legislation*, *supra* note 21, at 872 n.42.

⁴⁸ At this point, it may be instructive to note ways in which the various national laws on nuclear liability have assigned responsibility for the carriage of nuclear materials. The Austrian Act provides, as a general rule, that the operator of a nuclear installation who is the consignor shall remain liable until the goods have been taken in charge by the consignee. In the case of the import of nuclear substances into Austria, the consignee-operator is liable from the time of loading of such substances. The carrier is liable, however, where nuclear substances are merely in transit through Austria, or where the nuclear substances are sent to Austria without the written consent of the operator of a nuclear installation situated in Austria, or where the nuclear substances are not consigned to a nuclear installation or such an installation cannot be identified. Interestingly enough, however, the carrier can exonerate itself from liability by proving that it did not know nor should have known that the substances were nuclear substances. Austrian Federal Act of 29 April 1964 (effective 1 Sept. 1964), § 4(1)(2)(3)(iii). The Belgian Act of 18 July 1966 (effective 23 July 1966) holds the operator of a nuclear installation liable under the same circumstances as the Paris Convention. Belgian Act of 18 July 1966, Section 2. The Danish Act is similar to the Belgian, with the exception that the Ministry of Justice reserves the right to shift liability from the operator to the carrier when the operator gives his approval. Danish Act No. 170, 16 May 1967 (effective 1 July 1967), Chapter 3, § 13(3), 14(1)(2), and 15. Under the French Civil Code, the carrier would seem to be strictly liable as a custodian of a dangerous instrumentality causing damage. See, *Nuclear Liability Legislation*, *supra* note 21, at 879. However, Act No. 65-955 promulgated on 12 Nov. 1965 as a temporary measure would seem to hold the operator of a nuclear installation absolutely liable to the exclusion of any other person for damage resulting from a nuclear incident occurring during the course of carriage on his account. Act of 12 Nov. 1965, § 3. The German statute exposes carriers of nuclear materials to liability as "holders" of dangerous material under a negligence theory imposing the highest standard of care. However, the consignor of the shipment is under an obligation to indemnify the carrier for any such liability. German Atomic Act of 23 Dec. 1959 (effective 1 Jan. 1960), *as amended* by the Act of 23 April 1963, the Decree 22 Feb. 1962, itself amended by the Decree of 6 Aug. 1965, §§ 26(1)(2)(3), 35(1)(2). The Italian law accords with the provisions of the Paris Convention and provides that the operator of a nuclear installation shall not be liable when carriage is done by the person in charge of transport on whom such liability is transferred under national law. Act No. 1860 of 31 Dec. 1962 (effective 14 Feb. 1963) (Provisional, pending the entry into force in Italy of the Paris Convention.), Chapter III, §§ 16, 16(a) & 16(b). Japan, while not a signatory of the Paris Convention, holds that the consignee-operator is liable for damage during the carriage between two nuclear installations. Act Nos. 147-48 of 17 June 1961 (effective 15 Mar. 1962). Like the Italian Act, the Netherlands Act is provisional on the coming into force of the Paris Convention. It is interesting to note that the Dutch legislation attempts to reconcile the inconsistency found in the Paris Convention regarding the extension of the operator's liability into the territory of a non-Contracting Party. Under the Dutch Act, the operator who consigns nuclear substances shall be held liable for incidents occurring in the course of carriage until such time as the substances have been taken in charge by the consignee-operator or have reached the territory of the foreign country of destination. The consignee-operator's liability for imported nuclear substances takes effect when such substances have reached Netherlands territory. Netherlands Act of 27 Oct. 1965, §§ 5(a)(b)(c). The Spanish Act reproduces the essential principles of the Paris Convention. Spanish Act of 29 April 1964 (effective 4 May 1964), §§ 47, 48 & 50. The Swedish law has adopted the principle of absolute liability for the operator as consignee or consignor. However, the carrier may also be sued where the damage is caused during the course of carriage. The carrier then has a right of recourse against the operator up to the amount paid. Swedish Act of 3 June 1960 (effective 1 July 1960), § 4(b). The Swiss Act also holds the operator absolutely liable. However, like the Netherlands, the Swiss law attempts to reconcile the operator's liability as consignee or consignor with the effective jurisdiction of the legislation, *i.e.*, where the operator is consignee and the nuclear materials are imported from abroad, the operator is only liable for damage caused in Switzerland. Swiss Act of 23 Dec. 1959 (effective 1 July 1960), §

The laws of three states which have signed the Paris Convention apparently attempt to resolve this problem. Under the Netherlands Act of 27 October 1965, the operator-consignee is held liable for nuclear substances "from the time when he takes them in charge, including nuclear substances imported into Netherlands territory from the time they have left foreign territory."⁴⁹ The Dutch, therefore, would limit the operator's liability for carriage to damage or incidents which occurred within the Netherlands. The Swiss nuclear liability statute is similar to that of the Netherlands. The operator-consignee's liability is limited to damage "caused in Switzerland" by nuclear materials imported from abroad.⁵⁰ The United Kingdom Nuclear Installations Act, on the other hand, provides that no compensation is payable in respect to injury or damage incurred within a non-Contracting State unless suffered by persons or property on an aircraft registered in the United Kingdom or by such an aircraft.⁵¹

From the air carriers' point of view, of course, any language in the conventions which may extend the operator's liability to incidents or damage caused in non-Contracting territories must be treated as a welcome development. If the choice of law rules of the place of the incident or damage make the conventions the governing law, then air carriers may not be held primarily liable.⁵² Any inconsistency in the language of the conventions, nevertheless, requires that air carriers take adequate insurance precautions to cover all possible interpretations.

Another aspect of the operator's liability for carriage of nuclear goods which is of interest to air carriers is the language used to designate the time of the assumption or termination of that liability in the conventions. Where the goods are to be carried between Contracting States, the conventions employ the phrase "taking charge"; however, where the goods are to be transported between a Contracting State and a non-Contracting State, the phrase preferred by the drafters is "loaded on the means of transport."⁵³ Thus, if the operator is consignee, his liability commences after he has "taken charge" of the nuclear materials coming from a Contracting State or, if the goods come from the territory of a non-Contracting State, after they have been "loaded on the means of transport" by which they are to be carried from that territory. If, on the other hand, the operator is the consignor, his responsibility ends when another operator has "taken charge" of the nuclear materials or, if they are sent

12(2)(3)(4)(5). The British Act makes the operator (licensee) liable for all damage in the course of the carriage done on his account, including imports with his agreement from a country which is not a party to the Paris or Vienna Conventions. However, compensation is not payable in respect of injury or damage incurred within a non-convention country unless incurred by persons or property on a ship or an aircraft of British registry or by such a ship or aircraft. United Kingdom Nuclear Installations Act of 1965 (effective 1 Dec. 1965), §§ 7(2), 11, 13(2), & 21(3).

⁴⁹ Netherlands Act of 27 Oct. 1965, § 5(b)(c).

⁵⁰ Swiss Federal Act of 23 Dec. 1959, § 12(3).

⁵¹ United Kingdom Nuclear Installations Act of 1965, § 13(2).

⁵² In this respect, air carriers might even prefer a deletion of articles 2 and 23(a) of the Paris Convention which specifically state that the Convention does not apply to nuclear incidents which occur in the territory of non-Contracting States.

⁵³ Vienna Convention, art. II(1); IANEC Drafts are the same as Vienna; Paris Convention, art. 4.

into the territory of a non-Contracting State, before they have been "unloaded from the means of transport" by which they have arrived in that territory.

Neither the expression "taken charge" or "loaded" is defined in the conventions; for this reason, air carriers may expect to be involved in litigation where these expressions are in issue. Of the two terms, the latter will likely cause the greater difficulty. Air carriers ordinarily have the duty to load or unload cargo and to furnish proper facilities for such services⁵⁴ and will be liable for loss or injury sustained for negligent performance.⁵⁵ Thus, because of the undefined usage of the term "load," air carriers could be liable under national laws for damage caused by nuclear incidents occurring during the loading or unloading of the sources of nuclear energy. The obvious solution to this problem, of course, would be to amend the conventions so that the term "taken charge," expressly defined, would apply both where the carriage involves contacts with two Contracting States and where the carriage is made between a Contracting State and a non-Contracting State.⁵⁶

Two remaining aspects of the operator's liability under the conventions should be noted. First, if the nuclear damage is caused by a nuclear incident occurring while the materials are in storage incidental to their carriage, the conventions provide that the operator and not the bailee shall be liable.⁵⁷ Second, if the carriage involves materials consigned by a number of different operators, the maximum total amount for which the operators may be jointly and severally liable is the highest amount established with respect to any of them pursuant to the conventions. There is no accumulation of amounts for a nuclear incident in the course of transport.⁵⁸

B. *Except "Under Any International Agreement In The Field Of Transport"*

As has already been observed, the conventions basically provide that no one but the operator will be liable for nuclear damage caused by nuclear incidents, including those which occur in the course of carriage. Both Paris and Vienna, nevertheless, have a proviso clause to the effect that

⁵⁴ 13 C.J.S. § 67. This discussion assumes that the term "load" and "unload" will not be equated with "storage incidental to the carriage" for which the operator remains liable. Vienna Convention, art. II(1); Paris Convention, art. 4; IANEC Drafts are identical to the Vienna language.

⁵⁵ *Id.* It has been held that, even though the carrier in loading uses appliances furnished by the shipper himself, it will be liable for injuries resulting from defects in the appliances, if the appliances were under the exclusive control of the carrier and there was no assumption of responsibility on the part of the shipper.

⁵⁶ The *Exposé des Motifs* of the Paris Convention do not explain why the expression "loaded" or "unloaded" was selected as distinct from "taking charge." See generally, Paris, *Exposé des Motifs*, ¶¶ 22-27.

⁵⁷ This provision was inserted in the Paris and Vienna Conventions at the request of the air carriers. Vienna Convention, art. II(1), Proviso clause; Paris Convention, art. 4, recital clause; IANEC Drafts are the same as Vienna.

⁵⁸ Except in the case of transport, the conventions provide that the liability of different operators involved is joint and several and any of them may, therefore, be sued for the whole amount of the damage. The total compensation available is, therefore, the aggregate of the sums of each of the operators concerned. In any event, no operator is liable to pay more than the maximum amount established for him in respect of a nuclear incident in accordance with amount established under the conventions. Paris, *Exposé des Motifs*, ¶ 20 and 33; Vienna Convention, art. II(3); IANEC Drafts are the same as the Vienna Convention; Paris Convention, art. 5(d).

they shall "not effect the application of any international agreement [Vienna: "convention"] in the field of transport in force or open for signature, ratification or accession at the date of this convention [Vienna: "on which this convention is open for signature"]."⁵⁹ The IANEC Drafts, on the other hand, would supersede any conflicting clauses in existing international agreements in the field of transport between the ratifying parties and, therefore, do not include a similar proviso clause.⁶⁰ The import of the above-quoted language in the Paris and Vienna Conventions is quite clear: notwithstanding the basic design of the treaties, which is to channel all liability to the operator of a nuclear installation, an air carrier can still be held primarily liable for nuclear damage either under the Warsaw Convention (or that Convention as amended by the Hague Protocol) or under the Rome Convention of 1952.⁶¹ Should an air carrier be exposed to unlimited liability under any of these air transportation conventions, it could conceivably incur claims for compensation in excess of the limits of liability in force with respect to the operator of the nuclear installation.⁶² The practical implication of the proviso clauses is also apparent:

⁵⁹ Vienna Convention, art. II(5); Paris Convention, art. 6(b); ¶ 34 of the *Exposé des Motifs* of the Paris Convention reads as follows:

It has been thought advisable not to interfere with existing international agreements in the field of transport in force or open for signature, ratification or accession at the date of the Convention, especially since countries outside Europe are parties to them. International Agreements in the field of transport are understood to mean international agreements dealing with third party liability for damage involving a means of transport, international agreements dealing with collisions involving a means of transport and international agreements dealing with bills of lading. To avoid the possibility of conflicting provisions, it is laid down that the Convention does not affect the application of such agreements (Article 6(b)).

⁶⁰ IANEC Draft "A," art. XVII reads:

"As between states which ratify this Convention, this Convention shall supersede any international convention or agreement between the Contracting Parties which is in force, open for signature, ratification or accession at the date on which this Convention is opened for signature, but only to the extent that such convention or agreement is in conflict with the Convention." Art. 9 of Draft "B" is identical. During its fifth meeting, the Special Legal Committee agreed that the question of supercession could more appropriately be settled by a specialized diplomatic conference. REPORT OF THE SPECIAL LEGAL COMMITTEE, *supra* note 5, at 30, 83. At the first meeting of the Special Legal Committee, the question of supercession was discussed. One delegate stated that the United States had taken the position that the problems of atomic energy are so special that the law of atomic energy should provide the only rule. For this reason, an Atomic Energy Convention should supersede all previous conventions of a general nature, even those which have been signed but have not come into effect. The majority opposition to this position had, in the past, apparently been represented by the United Kingdom which took the view that it was desirable to keep in force all existing conventions in the field of transportation which might have a bearing on the atomic energy field, such as those governing civil aviation. *Id.* at 12.

⁶¹ Since the ICAO proposed conventions on aerial collisions and Air Traffic Control liability were not open for signature at the time when the Paris and Vienna Conventions were themselves open for signature, air carriers would, presumably, be immune from primary liability should nuclear damage become the object of a conflict between these conventions and the nuclear liability treaties.

⁶² Air carriers have recourse actions against the operator for claims paid under the air transportation conventions up to the amount of the operator's limitation of liability. These rights will be discussed in further detail below. In the United States, several courts have recently subjected air carriers to possible unlimited liability under the Warsaw Convention for reasons other than "willful misconduct" (art. 25); *Mertens v. Flying Tiger Line, Inc.*, 341 F.2d 851 (2d Cir. 1965) (military officer already on board on aircraft about to takeoff when ticket delivered); *Warren v. Flying Tiger Line, Inc.*, 352 F.2d 494 (9th Cir. 1965) (soldiers handed boarding pass at foot of ramp leading to plane about to takeoff); *Lisi v. Alitalia*, 370 F.2d 508 (2d Cir. 1966). (notice advising passenger of applicability of the Warsaw liability rules declared unreadable). Unlimited carrier liability under the Rome Convention would presumably occur in accordance with the provisions of article 12 of that Convention. At its Sixteenth Session, the ICAO Legal Committee made reference to the relationship between the nuclear liability treaties and the Rome Convention, insofar as liability for nuclear damage is involved. The Secretary

air carriers may have to insure for very high amounts in spite of the nuclear liability treaties.⁶³

Obviously it would be in the interests of air carriers if both Paris and Vienna followed the suggestion of the IANEC Special Legal Committee and provided for supersession of conflicting sections of existing conventions in the field of air transport.⁶⁴ To obtain such amendments at this late date would, no doubt, require lengthy negotiations amongst the parties signatory to the conventions. An interim solution, however, may be available to the benefit of air carriers. This would involve taking advantage of those provisions in the conventions which permit air carriers to be put in the place of the operator of a nuclear installation.⁶⁵ In order for this to happen, Contracting Parties must establish legislation under which air carriers may be deemed liable in accordance with the conventions in the place of the operator of a nuclear installation. Air carriers are required to make a formal request to the competent public authority in the Contracting State and to obtain the consent of the operator for whom it is carrying nuclear materials. Once this has been done, the air carrier would enjoy the limits of liability of the operator, although it would be restricted in the number of recourse actions available.⁶⁶

Undertaking such a procedure may not be of interest to air carriers which do not specialize or concentrate in the carriage of nuclear goods.⁶⁷ However, for those which contemplate a large volume of such consignments, and particularly if they do their own handling, the possibility of being deemed the operator of a nuclear installation with attendant advantages of a known and limited liability (albeit strict liability) may have

General of ICAO was requested to supply the ICAO Legal Sub-Committee on the Revision of the Rome Convention with information concerning the nuclear liability conventions. The Legal Committee also elected to retain in Part "B" of its General Work Program the topic "Liability in Respect of Nuclear Materials in Relation to Civil Aviation." *Summary of the Work of the Legal Committee During its Sixteenth Session* (Paris, 5-22 Sept. 1967), ICAO Doc. 8704, LC/155, 22 Sept. 67.

⁶³ It is obvious that not everyone believes that channelling of all liability to the operator of a nuclear installation is necessary for protection of the public or even desirable. See, e.g., *Liability Arising Out of Transportation of Nuclear Fuel, Radioactive Products or Waste—Channelling of Liability, Legal Questions and Insurance Problems*, Information Bulletin No. 13, Centre d'Etudes de la Commission Permanente du Risque Atomique, Comité Européen des Assurances, Zurich, Dec. 1966, at 27.

⁶⁴ Although the present language of the Paris and Vienna Conventions apparently represents the majority view, the time may come when the understanding of the unique nature of radiation damage and the high levels of security required to protect the public will dictate a change. It seems that only Sweden's national legislation follows the peculiar logic of the present conventions by permitting a carrier to be held liable along with the operator and, then, giving it a right of recourse against the operator. Swedish Act, §§ 4(b) and 9(a)(b). Of course, if the nuclear liability conventions do not include supersession provisions, it may be possible to amend the Warsaw and Rome Conventions to provide that they do not apply where nuclear damage is covered by the Paris or Vienna Conventions. Both Warsaw and Rome are currently being reviewed by ICAO. Such a provision has recently been included in the International Convention for the Unification of Certain Rules Relating to Carriage of Passenger Luggage by Sea, opened for signature at Brussels on 27 May 1967, as follows in article 15: "This Convention shall not affect the provisions of any international convention or national law which governs liability for nuclear damage."

⁶⁵ Vienna Convention, art. II(2); IANEC Drafts are identical to Vienna language; Paris Convention, art. 4(d).

⁶⁶ The following States have nuclear liability laws which permit liability to be shifted from the operator to the carrier: Denmark, Italy, Spain, and Switzerland. Danish Act, § 15; Italian Act, § 16; Spanish Act, § 50; and Swiss Act, § 12(4).

⁶⁷ It is foreseeable that air carriers will become more involved in the carriage of nuclear material. See, e.g., Beaton, *Nuclear Fuel for All*, 45 For. Affairs 662, 668 (1967).

appeal. It would obviously be in the interests of such carriers to persuade governments to provide legislation making such designations possible.⁶⁸

*C. Recourse Actions Available To Air Carriers
Against Operators Of Nuclear Installations*

As noted above, Paris and Vienna offer two rights of action to a person suffering damage caused by a nuclear incident occurring in the course of transportation of nuclear materials: first, against the operator liable under the conventions and, second, against the air carrier liable under existing international agreements in the field of transport. Having permitted this deviation from the principle of channelling all liability to the operator, however, the conventions proceed to grant limited rights of recourse to air carriers against the operator for compensation paid for damage caused by nuclear incidents under the transport agreements. In addition, the treaties give certain air carriers qualified rights of recourse for compensation paid under the laws of non-Contracting States.⁶⁹ Under Vienna, "airlines" which are "nationals" of a Contracting Party may acquire by subrogation the rights of anyone to whom they have paid compensation either under an international convention or under the law of a non-Contracting State. It is significant that no mention is made of the location of the incident or the damage. Paris, on the other hand, provides that any "person" (whether or not he is a "national" of a Contracting Party) who has paid such compensation under an international agreement or the laws of a non-Contracting State may have subrogation rights against the operator; however, if the incident or damage occurred in the territory of a non-Contracting State, such rights may only be acquired if the "person" paying the compensation has his "principal place of business" in the territory of a Contracting Party. Thus, the Paris Convention would discriminate against air carriers which did not have their "principal place of business" in a Contracting State should the incident occur in the territory of a non-Contracting State.⁷⁰

The language of the recourse provisions of the conventions raises several questions. For example, what is the meaning of "national" of the Contracting Party as that term is applied to an "airline" in the Vienna

⁶⁸ At a meeting of the Panel of Experts of the IAEA, Aug. 1959, during the drafting of the Vienna Convention, a paper was put forward advocating that the principle of channelling to the operator should not apply where the carriage was undertaken by those who specialize in the transportation of nuclear substances or where the incident occurred while the materials were in the possession of a forwarding agent who specializes in the handling of nuclear materials. *Liability Arising out of Transportation of Nuclear Fuel*, *supra* note 63, at 29-30.

⁶⁹ Vienna Convention, art. IX(2); IANEC Drafts are identical to the Vienna language; Paris Convention, art. 6(d) (e).

⁷⁰ Art. 6(e) of the Paris Convention, unmodified by the additional Protocol of Jan. 1964, made a token effort to eliminate the discrimination against air carriers from non-Contracting States by providing that the OECD Council could decide that carriers whose principal place of business was in the territory of a non-Contracting State may also enjoy rights of recourse against the operator to the same extent as persons having their principal place of business in the territory of a Contracting Party. In making this decision, the Council was to give due consideration to the general provisions on third party liability in the field of nuclear energy in such non-Contracting State and to the extent to which these provisions are available to the benefit of nationals of, or persons whose principal place of business was in the territory of the Contracting Parties. See, *Paris Convention, Exposé des Motifs*, § 37.

clause? It is conceivable that a court may one day have to decide whether that expression is restricted to airlines whose aircraft are registered in a Contracting State or, more broadly, to those airlines which have agents registered with the government of a Contracting Party. Again, both Paris and Vienna imply that the subrogation rights acquired against the operator impose upon him the obligation of reimbursing air carriers to the full extent to which they may have paid compensation under an international agreement.⁷¹ If this is the case, it raises the possibility that an air carrier may not be able to exercise his recourse rights because the operator's required security fund is too low or has already been depleted in satisfying direct actions. This, of course, again places the air carrier in the position of having to make contingent insurance arrangements in spite of the conventions.

Partial solutions to the shortcomings of the recourse procedures for air carriers may be proposed. The most obvious course of action would be to follow the example of the IANEC Drafts and to provide that Paris and Vienna supersede the air carrier liability conventions insofar as they are in force between Contracting Parties. This would eliminate the need for a recourse action where the incident occurred in the territory of a Contracting Party and would also do away with the requirement that the air carrier appear as a defendant in the place of or with the operator who is primarily liable. If, on the other hand, the cumbersome recourse arrangement must be retained, air carriers might insist (as between Contracting Parties which are also parties to Warsaw or Rome) that the limitations of liability in the transport agreements be linked with the actual amount which the air carrier can recover in a recourse action against the operator. Still another solution, varying from that just mentioned, would be to amend the nuclear liability conventions to provide that the operator's liability in a recourse action by an air carrier based upon Warsaw or Rome should be flexible enough to absorb the full amount of any compensation paid by the air carrier in a direct action. Where the incident took place in a non-Contracting State, and the recourse actions are to be based either upon the law of a non-Contracting Party or upon an international air transport convention, it is recommended that the conventions should not limit the recourse action to airlines which are "nationals" or have their principal place of business in Contracting States. Rather, it would seem more equitable in these circumstances to grant rights of recourse to all air carriers which are engaged in carrying nuclear goods on behalf of an operator designated by any Contracting Party at the time of the incident.

Air carriers' rights of recourse against the operator of a nuclear installation may also be influenced by other language in Vienna and the IANEC Drafts. These conventions would exonerate the operator from liability if he is able to prove that the nuclear damage resulted wholly or partly from the "gross negligence" of persons (including corporations) suffering

⁷¹ Under the Vienna language, the subrogation rights shall be "up to the amount which he [air carrier] has paid." Art. IX(2). The Paris language is identical. Art. 6(e). Nevertheless, the *Exposé des Motifs* of the Paris Convention state that the recourse rights are only available "within the limit laid down for the operator in question pursuant to Art. 7 of the Convention." ¶ 36.

the damage.⁷² It is not clear whether the "gross negligence of the person suffering the damage" would include the gross negligence of an air carrier which may have been carrying the nuclear goods causing the incident, which gives rise to its claim for a recourse action against the operator. It seems apparent that the operator would remain liable to non-negligent persons through the doctrine of "channelling," that is, he could be directly liable along with the air carrier whose gross negligence led to the nuclear incident. It is suggested that the air carrier should retain a right of recourse against the operator even if the incident is found by a competent court to have been caused by its "gross negligence." This is particularly important because the use of the term "gross negligence" immediately raises the old problem of the proper definition of "wilful misconduct" or "dol" under the Warsaw Convention (as unamended by the Hague Protocol).⁷³ If a court were to determine that an air carrier must incur unlimited liability under Article 25 of the Warsaw Convention, and if no recourse action were available against the operator under the Vienna or IANEC Drafts Conventions, the risk to air carriers for the carriage of nuclear materials could be great indeed.⁷⁴ Perhaps one solution to this problem (if it is a problem) would be to clarify the language of the Vienna Convention and the IANEC Drafts by stating specifically that the expression "gross negligence of the person suffering the damage" does not include air carriers and does not inhibit their rights of recourse. In the alternative, air carriers may wish to include in their contracts with operators a provision which clarifies this point.⁷⁵

D. Recourse Actions Available To Operators Of Nuclear Installations Against Air Carriers

The conventions also establish conditions giving the operator limited rights of recourse for damage caused by nuclear incidents. Under Vienna, Paris, and alternative "A" of the IANEC Drafts, the operator may recover compensation paid up to the limits of the conventions against individuals

⁷² Vienna Convention, art. IV(2); IANEC Drafts are identical. The operator only has this release if the competent court so provides in accordance with its law. The Paris Convention does not contain a comparable provision. The term "person" as used in Vienna and the IANEC Drafts includes "any individual, partnership, any private or public body whether corporate or not, any international organization enjoying legal personality under the law of the Installation State, and any State or any of its constituent subdivisions." Vienna Convention, art. I(1)(a); IANEC Drafts are identical to the Vienna language.

⁷³ Art. 25 of the Warsaw Convention reads: "Le transporteur n'aura pas le droit de se prévaloir des dispositions de la présente Convention qui excluent ou limitent sa responsabilité, si le dommage provient de son dol ou d'une faute qui, d'après la loi du tribunal saisi, est considérée comme équivalente au dol."

⁷⁴ This problem may not arise under the Rome Convention because intent to cause damage must be proven before unlimited liability is sanctioned. Rome Convention, art. 12. As noted above, the operator of a nuclear installation obtains a right of recourse under all of the conventions if he can prove intent to cause nuclear damage.

⁷⁵ It is interesting to note that the Special Legal Committee of the IANEC at its fifth meeting (Feb. 1967) debated the advisability of retaining a provision in the Drafts which would relieve the operator from liability to a "person who had been guilty of gross negligence." Some members of the Committee favored the deletion of the reference to gross negligence in the interest of avoiding ambiguity and protecting those injured. However, the Minutes of the meeting state that the "majority of the Committee felt that a point of principle is involved here, and the present text was continued." REPORT OF THE SPECIAL LEGAL COMMITTEE, *supra* note 5, at 62-63.

who have caused a nuclear incident by an act or omission done with the intent to cause the damage.⁷⁶ The above agreements would also permit operators recourse where this had been expressly provided in a written contract.⁷⁷

IANEC Draft alternative "B" would give the operator a right of recourse (based on fault) against any person who has manufactured materials or equipment for, or who has furnished materials, equipment, or services in connection with the design, construction, repair, or operation of a nuclear installation, or who has transported or stored nuclear material. This alternative marks a significant departure from the scheme of the Vienna and Paris Conventions and is similar to a proposal put forth by Argentina, Brazil, India, and the United Arab Republic at the Vienna Conference.⁷⁸ The members of the IANEC Special Legal Committee who supported alternative "B" put forth several arguments: (1) that, in actual business practice, it will be the law of supply and demand which should prevail since suppliers and designers can protect themselves through appropriate contractual provisions; (2) that suppliers and designers might take less care if they knew that there was no possible recourse against them; (3) that the operators should not be made responsible for the faults of designers or manufacturers located abroad; (4) that the right of recourse does not affect the principle of channelling liability against the operator since the principle of absolute and exclusive liability is applied only to relations between the operator and the victim and, once the operator has paid the compensation, the channelling principle will have reached its objective; (5) that this is not a question of joint liability of operators, in which case the burden would be distributed between them; (6) that the operator should have the right of appeal against manufacturers or suppliers of nuclear equipment or substances so long as he can prove that the damages were due to the fault of the latter; and (7) that arguments which are economic in nature should not be used to determine questions which essentially involve legal principles.⁷⁹

⁷⁶ Vienna Convention, art. X; Paris Convention, art. 6(f); IANEC Draft "A," art. X, Alternative "A"; Draft "B," art. 6, Alternative "A."

⁷⁷ *Id.* In the 1960 version of the Paris Convention, where a Contracting State subjected the transit of nuclear substances through its territory to the condition that the maximum amount of liability of the foreign operator concerned was increased up to the limit fixed for operators of nuclear installations in its territories and a transit was carried out without his consent, the operator concerned had a right of recourse against the carrier in question to the extent that he was liable in excess of the amount fixed for him pursuant to the convention, except where the transit was for the purpose of saving or attempting to save life or property or was caused by circumstances beyond the control of the carrier. The apparent purpose of this provision was to discourage unauthorized transit; however, the Additional Protocol of 1964 deleted the provision with the result that the Paris Convention does not conflict with Vienna. *Paris, Exposé des Motifs*, § 19. It is interesting to note that the word "individual" acting or omitting to act intentionally refers to a physical person and thus excludes the principle of *respondeat superior*. See also, REPORT OF THE SPECIAL LEGAL COMMITTEE, *supra* note 5, at 63.

⁷⁸ Doc. CN-12/2 at 21; The proposal was, of course, not adopted. See, REPORT OF THE SPECIAL LEGAL COMMITTEE, *supra* note 5, at 104.

⁷⁹ REPORT OF THE SPECIAL LEGAL COMMITTEE, *supra* note 5, at 104; the delegates from Brazil and Mexico expressed the preference of their governments for alternative "B." The United States preferred alternative "A." The delegate from Argentina abstained from taking a position. The Committee agreed to leave the decision as to which alternative is preferred to a specialized diplomatic conference. *Id.* at 63.

It is submitted that the reasons offered by the supporters of alternative "B" of the IANEC Drafts run counter to the two basic purposes of the conventions: protecting victims and encouraging the nuclear energy industry. Pyramiding of insurance would probably take place if parties other than the operator were held secondarily liable only upon proof of fault. The argument that giving broad recourse rights to the operator does not upset the principle of "channelling" is, in this light, quite fallacious. The purpose of channelling is not merely to give a guarantee to victims that they will be compensated, but also to assure that the party liable can marshal the resources to provide adequate protection. Spreading the liability by extending the operator's rights of recourse may jeopardize this possibility, thus resulting in non-compensated victims. In this sense, the Vienna and Paris regimes are seen as new and somewhat revolutionary ideas; they should not, however, be dismissed as merely "economic in nature" and therefore not involving "legal principles."⁸⁰ More to the point of this paper, however, is the fact that the reasons given in support of alternative "B" do not explain why air carriers as transporters of nuclear goods should be made subject to recourse actions where the incident was caused by their fault. Air carriers do not design or manufacture the nuclear materials; moreover, it cannot be effectively argued that they would take more care if they knew that they would be secondarily liable. More likely, the threat of such liability for fault would either discourage air carriers from transporting the sources of nuclear energy or, in the alternative, make such transportation so expensive as to be prohibitive.⁸¹

As mentioned earlier, there may be some difficulty with the Vienna and IANEC use of the term "gross negligence" in connection with air carriers' rights of recourse against the operator of a nuclear installation. Clearly, however, the operator is not liable to the individual who intentionally caused a nuclear incident and he has a right of recourse against such an individual. Since the term "individual" refers to a physical person and not to a corporation, and precludes the doctrine of *respondeat superior*, presumably air carriers as corporate entities would be immune from the operator's recourse action where their servants had caused the incident intentionally.⁸²

⁸⁰ Apposite here is Dean Roscoe Pound's well-known statement on the end of law: "I am content to think of law as a social institution to satisfy social wants—the claims and demands and expectations involved in the existence of civilized society—by giving effect to as much as we may with the least sacrifice, so far as such wants may be satisfied or such claims given effect by an ordering of human conduct through politically organized society." POUND, AN INTRODUCTION TO THE PHILOSOPHY OF LAW, 47 (1922).

⁸¹ Usually the carrier would not be in a position to have any direct control over the packing of nuclear substances. This would not preclude a carrier from making a safety check before accepting the consignment; however, even this may require a considerable investment by air carriers and might force certain carriers to become specialists in the field. If this should be the case, as noted earlier, carriers may wish to be declared "operators" for the purpose of clarifying their liability and to qualify for the appropriate insurance or other security available.

⁸² It is interesting to note that in alternative "B" of the IANEC Drafts, the term "individual" is dropped in favor of the term "person." "Person" is defined in the Draft Conventions as "any individual, partnership, any private or public body whether corporate or not, any international organization enjoying legal personality under the law of the Installation State, and any state or any of its constituent subdivisions." The use of the term "person" in alternative "B" was apparently an error and should read "individual" with the intention of meaning a physical person and not

A more important question, however, is the meaning of the expressions "done with intent to cause damage" and "for fault of such person." If the term "individual" or "person" as used in alternative "B" precludes the concept of *respondeat superior*, would the operator have no recourse rights beyond the individual even in the case where a court ruled that the accident was due to "wilful misconduct" as the term is used in the Warsaw Convention? Again, would the operator of a nuclear installation have no recourse rights other than against the individual even where unlimited liability was sanctioned against the air carrier in accordance with the Rome Convention?⁸³

The matter is further confused by the language in Article 6(g) of the Paris Convention which states that if the operator has a right of recourse against "any person," than that "person" shall not to that extent have a right of recourse against the operator. There being no link between the term "individual" and "person" in the Convention, this provision is not entirely clear. Perhaps one solution, at least to the benefit of air carriers, would be to add to the Paris, Vienna, and alternative "A" language clarifying definitions of the term "individual" and the expression "with intent to cause damage."⁸⁴

E. Other Considerations

Many other aspects of the conventions may influence the liability of air carriers for damage or loss due to a nuclear incident occurring in the course of the carriage of nuclear goods. These will be discussed topically.

1. "A Grave Natural Disaster of an Exceptional Character"

Although proof of fault is not required to establish the liability of an operator, nevertheless, he is not totally deprived of defenses. All of the conventions give him an immunity from liability where the damage caused by a nuclear incident was due directly to "an act of armed conflict, hostilities, civil war" or "insurrection."⁸⁵ In addition, the operator will not be liable for nuclear damage caused by a nuclear incident which was directly due to "a grave natural disaster of an exceptional character," unless the law of the Installation State provides to the contrary.⁸⁶ Thus, air carriers may find themselves in the position of having to rely upon the

the "person" as defined in the Drafts or the Vienna Conventions. REPORT OF THE SPECIAL LEGAL COMMITTEE, *supra* note 5, at 63.

⁸³ Assuming, of course, that the operator and the air carrier were jointly sued in one action by injured parties.

⁸⁴ Apparently the limitation of the operator's recourse to individuals rather than to corporate defendants was regarded as a concession to the latter; however, it is difficult to understand why the recourse action against an individual is retained at all in view of the likelihood that he would be able to contribute very little to the relief of the operator. On the other hand, if the term "intent" as used in the conventions is so broad as to require a showing of "awareness" of possibly unsafe consequences, then it is likely that the corporate employer would become involved in any event through his responsibility to corporate officials and employees in the form of insurance, indemnity, etc. In this case, the conventions would again be bordering on the problem of creating a pyramiding of insurance and getting away from the concept of channelling. See generally, *Nuclear Liability Legislation*, *supra* note 21, at 876, 877.

⁸⁵ Vienna Convention, art. IV(3)(a); IANEC Drafts are identical; Paris Convention, art. 9.

⁸⁶ Vienna Convention, art. IV(3)(b); IANEC Drafts use the Vienna language; Paris Convention, art. 9.

defenses available under the various national laws should actions be brought against them where the operator has successfully been granted an immunity under the conventions.

It is doubtful whether an air carrier would be denied the right to defend under these circumstances where the operator already has been successful in so doing. However, a possible problem may arise in the construction of the expression "a grave natural disaster of an exceptional character."⁸⁷ It is difficult to predict how courts may construe this language, but it is conceivable that they will not equate it with the language of Article 20(1) of the Warsaw Convention which exonerates air carriers from liability upon proof that they have taken all necessary measures to avoid the damage. In addition, air carriers might remain liable under Article 5 of the Rome Convention which permits exoneration of the operator of the aircraft only "if the damage is the direct consequence of armed conflict or civil disturbance." Thus, air carriers may be left solely liable when the nuclear damage was caused by an incident during the course of transportation which was ultimately due to an unusual natural phenomenon.⁸⁸

It is difficult to suggest how air carriers could secure the same terms of exoneration to themselves as are granted to operators, short of an amendment to the conventions. For this reason, air carriers may wish to weigh the possibility of problems created by the language which exonerates the operator from liability in considering whether they should seek to be "deemed" operators of nuclear installations where possible under the laws of Contracting Parties.

2. "Nuclear Substances"—"Nuclear Materials"

Another area where air carriers may wish to exercise prudence is in determining whether their consignments are actually covered by the conventions. Both Paris and Vienna, as well as the IANEC Drafts, limit the liability of the operator to nuclear damage caused by the radioactive properties of specified "nuclear material" (Vienna and IANEC Drafts)

⁸⁷ Five States—Belgium, Italy, Japan, the Netherlands and Spain—use the expression "grave natural disaster of an exceptional character" in describing a circumstance which exonerates the operator from liability under their nuclear liability laws. Belgian Act, § 2; Italian Act, § 15; Japanese Act, § 3(1); Netherlands Act, § 8; and Spanish Act, § 45. The French and Swiss Acts would permit exoneration of the operator if the damage was caused directly by an "exceptional natural disaster." French Act, § 5; Swiss Act, § 14. The United Kingdom permits exoneration in the case of "natural disasters." United Kingdom Act, § 13(4). Austria, Denmark, Germany and Sweden do not mention acts of God or natural disasters of any kind as grounds for exoneration. Austrian Act, § 9; Danish Act, § 16(2); German Act, § 26(1)(2); and Swedish Act, § 2(iv). The United States Atomic Energy Act, § 170(a), requires licensees to waive any exemption from third party liability to which he may be entitled under Federal or State law. Since the Act does not except "act of God" from the defenses waived, it would apparently permit liability where the plaintiff claimed through it. See, *The New Price-Anderson*, *supra* note 4, at 167.

⁸⁸ According to the *Exposé des Motifs* of the Paris Convention, the expression "a grave natural disaster . . ." does not include the classic exonerations owing to *force majeure* or acts of God; rather, "a grave natural . . . etc." is one which is "catastrophic and completely unforeseeable." The *Exposé* further points out that where the operator is exonerated, common law applies and those responsible may "therefore be sued as ordinary tortfeasors." *Exposé*, *supra*, ¶ 48. Under the so-called "Montreal Agreement" of 14 May 1966, air carriers undertaking the transportation of passengers, to, from or through the United States specifically waive the defenses of Article 20(1) of the Warsaw Convention.

or "nuclear substances" (Paris).⁸⁹ This means that certain nuclear goods, for example natural uranium and depleted uranium, are excluded from the conventions. The conventions also exclude radioisotopes and nuclear fuels which have been refined to the point where they can be used for scientific, medical, or industrial purposes.⁹⁰ In addition to the sources of nuclear energy which are expressly excluded from the conventions, all of the treaties provide that deliberative bodies of their sponsoring international organizations (*i.e.*, the IAEA, the OECD, and the IANEC) may establish maximum limits for the exclusion of "small quantities" of the sources of nuclear energy from the application of the conventions should they deem that the risks occasioned by the use or carriage of the sources obviate the extraordinary legal regimes created by the conventions.⁹¹

In order to determine that their consignments fall within the terms of the conventions, it will be imperative for air carriers to keep abreast of the activities of the pertinent deliberative bodies and of the regulations established by each of the Contracting Parties. It may also be advisable before undertaking the carriage of the sources of nuclear energy to secure from the origin, destination, and overflowed States affidavits from the highest authorities that the consignments are covered by the Conventions.⁹²

A related matter of interest to air carriers is that the conventions do not cover damage caused by ionizing radiation, either during the carriage of nuclear materials or in the nuclear installation. They do, however, permit Installation States to enact laws holding the operator liable for ionizing radiation which occurs at the nuclear installation.⁹³ This means that air carriers may be exposed to liability for harm caused to goods or passengers or other third parties due, for example, to radiation caused by a

⁸⁹ These terms are defined in Vienna Convention, art. I(1)(h); IANEC Drafts are the same as Vienna; Paris Convention, art. 1(a)(v).

⁹⁰ Article 1(a)(iv) of the Paris Convention excludes both nuclear fuels and radioisotopes outside a nuclear installation which are used or intended to be used for "any industrial, commercial, agricultural, medical or scientific purposes." Article I(1)(g) of the Vienna Convention and the IANEC Drafts, on the other hand, would exclude only radioisotopes which have reached the final stage of fabrication "so as to be useable for any scientific, medical, agricultural, commercial, or industrial purpose." The Standing Committee of the IAEA has agreed that radioisotopes "useable" for the purposes listed (Vienna) means the same as "used or intended to be used" in the Paris Convention.

⁹¹ Vienna Convention, art. I(2); Paris Convention, art. 1(b); the IANEC Drafts are identical to the Vienna Convention with the exception that the maximum limits for the exclusion of small quantities established by the competent organ of the IANEC shall be within the limits established by the Board of Governors of the IAEA. To relieve any doubts that the Vienna Convention permits Installation States to exclude small quantities of nuclear material which are outside a nuclear installation, the Board of Governors of the IAEA passed a resolution on September 11, 1964 clarifying this point (so long as the consignments comply with the provisions set forth in the Agency's *Regulations for the Safe Transport of Nuclear Materials*). Standing Committee on Civil Liability for Nuclear Damage, REPORT OF THE SECOND SERIES OF MEETINGS, Vienna, 23-27 Oct. 1967, G.(CN/SC-14).

⁹² This will be easier under the Paris regime than under the Vienna because the Steering Committee of the ENEA acts by itself to determine which small quantities are excluded (rather than having the individual States make their own determination against the standards set by the Committee). Paris Convention, art. 1(b). It is also interesting to note that the Paris Convention permits the Steering Committee to exclude "any nuclear installation" as well as the sources of energy if the risk is deemed to be small. *Id.*

⁹³ Vienna Convention, art. I(1)(k)(iii); IANEC Drafts are identical to Vienna; Paris Convention, art. 3(c).

leaky container in the cargo hold of the aircraft. Air carriers can, of course, seek an indemnity arrangement with consignors and consignees for such loss, but a better long-term solution would seem to call for an amendment to the conventions permitting Contracting States to adopt legislation which would hold the operator liable for ionizing radiation both at the installation and during properly authorized carriage.

Another matter related to the nature of the consignments involves the carriage of radioactive waste, particularly during waste disposal operations. Article 1(2) of Vienna and identical language in the IANEC Drafts provides that Installation States may enact legislation permitting carriers of nuclear material "or a person handling radioactive waste" to be designated or recognized as the operator of a nuclear installation in the place of that operator. (This procedure has been mentioned earlier as a valuable concession to air carriers, especially those which contemplate heavy traffic in the sources of nuclear energy.) Paris, on the other hand, only permits carriers to be deemed operators in accordance with appropriate laws of the Contracting Parties.⁹⁴

The difference between the Paris and Vienna language has prompted the question whether a carrier designated or deemed an operator of a nuclear installation may engage in the carriage of radioactive waste in that capacity, or whether its fictional designation as operator only applies when the consignments do not include radioactive waste materials. This problem was discussed by governmental experts during the preparation of the Additional Protocol to the Paris Convention; the conclusion was that the Paris language should be interpreted as including "a person handling radioactive waste" and covers the case of a person carrying on the business of disposing of such waste. In consequence, all of the provisions pertaining to the carriage of nuclear substances in the Paris Conventions would apply to the carriage of waste materials during waste disposal operations.⁹⁵ It may, therefore, behoove air carriers which wish to be deemed operators in accordance with the Paris Convention to seek a certification from the appropriate Contracting Party to the effect that the special liability regime of the Convention will apply in the case of carriage in connection with radioactive waste disposal operations.

A final problem with the nature of the consignments may occur where the carrier has on board nuclear materials consigned by or to more than one operator of a nuclear installation. Should an incident occur during the carriage, and the air carrier be held liable under one of the air transport liability conventions, the question may arise as to which of the operators of a nuclear installation is secondarily liable in a recourse action. This, of course, may give rise to serious questions of causation which will be touched upon below. The basic question of assignment of responsibility, however, is answered in the conventions which provide that the operator shall be jointly and severally liable.⁹⁶

⁹⁴ Paris Convention, art. 4(d).

⁹⁵ *Points Discussed*, *supra* note 7, at 7.

⁹⁶ Vienna Convention, art. II(3); IANEC Drafts are identical to the Vienna language; Paris Convention, art. 5(d).

The question naturally arises as to what would happen should one consignment consist of a nuclear substance or material as defined in the conventions, and another on the same flight, be considered to be a "small quantity" and, therefore, by itself, excluded under the terms of the conventions. Would air carriers be able to demonstrate that the nuclear damage was caused by a nuclear incident involving the radioactive properties of the consignment which came within the definition of nuclear substances or material? Should either consignor or consignee be permitted to defend against an air carrier's recourse action on the grounds that it could not be shown that the nuclear incident actually causing the nuclear damage involved radioactive properties from his consignment? The obvious solution to this problem is for air carriers to avoid such multiple consignments on the same aircraft or in the same place of storage incidental to the carriage.

3. *Evidence of Financial Security*

All of the conventions require the operator "liable" to provide the carrier with a certificate (issued by or on behalf of the operator's insurer or financial guarantor) which states the amount, type, and duration of the security and the sources of nuclear energy in respect of which the security applies.⁹⁷ The conventions further provide that the statements made on the certificate may not be disputed by the person providing the financial security. Air carriers should take care that they are in receipt of these certificates before undertaking to transport nuclear goods on behalf of an operator. To do so, however, may be difficult for air carriers when the consignor is a national of a non-Contracting State and the carriage is between non-Contracting States and Contracting States. It will be recalled that the consignee-operator in this situation does not assume liability until the sources of nuclear energy have been loaded upon the means of transport with his prior written consent, and, therefore, it will be incumbent upon air carriers to procure the certificate from the consignee-operator in the Contracting State.⁹⁸

4. *Liability for Damage to the Means of Transport*

A peculiarity of the conventions, and one which may be of considerable importance to air carriers, is that the operator is not liable for nuclear damage to the means of transport upon which the sources of nuclear energy were being carried at the time of the incident.⁹⁹ As has been noted earlier, this anomaly is apparently the result of pressure on the drafters by certain insurance interests who regarded the carriers as tantamount to

⁹⁷ Vienna Convention, art. III; Paris Convention, art. 4(c); IANEC Drafts are identical to the Vienna language.

⁹⁸ It is interesting to note that the Standing Committee on Civil Liability for Nuclear Damage of the IAEA has been working on a uniform certificate for carriers which would state that the liability of the operator for transport involving non-Contracting States would not take place until the material has been unloaded from or after it was loaded on the means of transport. REPORT ON SECOND SERIES OF MEETING, 23-27 Oct. 1967.

⁹⁹ Vienna Convention, art. IV(5); Paris Convention, art. 3(a); IANEC Drafts are the same as Vienna.

a third party in relation to the operator.¹⁰⁰ It may be that the operator would remain liable under the common law of the Contracting State. There is some support for this position in that the operator is expressly exonerated in the conventions for liability "under this convention" (Vienna) or "in accordance with this convention" (Paris). Should this not be the case, however, air carriers could attempt to exact a waiver of the conventions' defense from the operator in the manner of the recent amendments to the Price-Anderson Act. This waiver might also include a provision requiring the operator to obtain appropriate insurance to cover damage to the means of transport.

5. Causation

Perhaps the greatest shortcoming of the conventions will prove to be the failure to elaborate expressly on the quantum and nature of the evidence of nuclear damage which must be demonstrated in order to invoke the liability of the operators. As written, the conventions merely state that the operator shall be liable "upon proof that such damage [nuclear damage] has been caused by a nuclear incident."¹⁰¹ The procedural or adjectival law which will define the level of proof required and decide questions of cause-in-fact and cause-in-law will be that of the court seized of the case, that is, the so-called "competent court."¹⁰²

There are two specific reasons why the terms "proof" and "caused by" should be clarified: (1) the social policy underlying the conventions and (2) the peculiar nature of radiation injuries. There can be little doubt today that the quantum of proof and the meaning of the term cause-in-fact are not "policy neutral concepts," but are viewed by the governments and courts as key ingredients in the enforcement of certain public policies.¹⁰³ Certainly the nuclear liability conventions are not "policy neutral;" on the contrary, a very rigid regime of liability is being established in order to protect innocent third parties. In this light, it seems quite absurd to leave to the various national courts the determination of key questions which could upset, in practice, the basic policies of the conventions. In addition, parties whose responsibilities may be affected by the conventions, such as air carriers, deserve to have a greater foreknowledge of these matters in order to make fair and proper decisions on self protection, legal tactics, and strategy in the event of lawsuits. A collateral benefit from such knowledge would be the expeditious disposition of "nuisance suits" which are foreseeable under the conventions.

The second reason in favour of a more explicit statement of the terms "proof" and "caused by" is the unusual nature of radiation injury. In the familiar cases of accidents involving aircraft, it may be said that the temporal sequence between the cause-in-fact and the alleged injury is

¹⁰⁰ SEN (59) 79, *supra* note 36.

¹⁰¹ Vienna Convention, art. II(1); Paris Convention, art. 3(a); IANEC Drafts are the same as Vienna.

¹⁰² Vienna Convention, arts. XI, XII, and XIII; Paris Convention, arts. 13(a) (b) (c) (d) and 14; IANEC Drafts are virtually the same as Vienna on this point.

¹⁰³ O'Toole, *supra* note 4, at 751-65.

quite close. The onset of radiation damage, on the other hand, may take several years from the date of cause-in-fact, and, even then, may require elaborate scientific evidence to show only a probability that the harm was the result of the alleged exposure.¹⁰⁴ As a consequence, it is conceivable that (in the absence of clarification in the conventions) courts in various jurisdictions may hold the operator and/or air carrier liable in some cases, while in other jurisdictions courts may find just the opposite on the same evidence, particularly where multiple consignments are involved.¹⁰⁵

Several suggestions have been made to alleviate the hardships which may confront defendants and claimants alike because of the long temporal sequence between the cause and the harm in radiation cases. One ameliorating proposal would have the burden of proof based on established statistical probabilities; here, the claims would be paid relatively promptly on the basis of prospective disability.¹⁰⁶ Perhaps a more practical solution is that which Professor Estep of the University of Michigan has proposed. Professor Estep's plan envisages the establishment of a "contingent injury fund" based on statistical experience. Claimants would provide evidence of exposure in order to make a recovery. The operator and other potentially liable parties, such as air carriers, would, presumably, be able to provide an adequate reserve by insurance based upon the average award or on a set maximum amount.¹⁰⁷ A similar contingent injury fund formed part of the recent amendments to the Atomic Energy Act of 1954 in the United States; but in this case the insurers only provide emergency assistance payments to members of the public following a nuclear accident, such as food, housing, and medical services. These benefits would be credited against any final judgment, but would not be construed as an admission of liability, and, for that reason, no release or compromise would be exacted from the person benefitted.¹⁰⁸ (A proposal along the lines of the United States AEC amendments was also made by the Mexican delegate to the Special Legal Committee of the IANEC and has been referred to the body for study.¹⁰⁹)

6. *Distribution of Compensation*

Under the conventions, the nature, the form, and the "equitable distribution" of compensation is left to the *lex fori* of the competent court.¹¹⁰ For this reason there are no guarantees that there will be any funds remaining with the operator to meet recourse claims by air carriers under the conventions. This may be looked upon as a shortcoming in the design of the treaties inasmuch as it seems rather fatuous to suggest that a right has been given to air carriers, when, upon execution, this may amount to nothing more than an unsupported contingency. The obvious way out of

¹⁰⁴ *Id.*

¹⁰⁵ *See, Nuclear Liability Legislation, supra* note 21, at 881-89.

¹⁰⁶ *Id.* at 885.

¹⁰⁷ *Id.* at 899.

¹⁰⁸ *The New Price-Anderson, supra* note 4, at 164.

¹⁰⁹ REPORT OF THE SPECIAL LEGAL COMMITTEE, *supra* note 5, at 37.

¹¹⁰ Vienna Convention, art. VIII; Paris Convention, art. 11; IANEC Drafts are identical to Vienna.

this situation is to amend the conventions to provide that the operators shall remain responsible for claims paid by air carriers. Failing such amendments, it is conceivable that air carriers could exact from the operator an indemnification agreement, although the enforceability of such a contract is questionable as long as the conventions remain unamended.

An expression of concern about the distribution of compensation was made recently at the Second Series of Meetings of the Standing Committee of the IAEA (October 1967). After discussion, however, the Committee could only conclude that should the entire fund be exhausted and "there is nothing left to satisfy later claims which may be made for delayed damage . . . it would be up to each government to cope with the situation in accordance with its national legislation."¹¹¹ This attitude on the part of the Standing Committee would suggest that an attempt to amend the conventions at this time would not be well received.¹¹²

7. Extinguishment of Rights to Compensation Arising Under the Conventions

The provisions of the conventions which extinguish rights to compensation thereunder reflect an appreciation of the long temporal sequence which may occur between the cause and harm in incidents involving radiation. All of the treaties require claims to be brought within ten years from the date of the nuclear incident, unless the operator is insured for a longer period and national laws so provide.¹¹³ (If the nuclear incident occurs at a time when the sources of nuclear energy were either stolen, lost, jettisoned, or abandoned, the time limit is extended to twenty years from the date of the incident.¹¹⁴)

Notwithstanding the relatively lengthy periods in which claims may be brought, there are also provisions which permit Contracting States to provide by law for shorter periods of time if the person suffering the damage had knowledge of or should have known about the damage. Under Vienna and the IANEC Drafts the minimum time which Contracting Parties may establish is three years; under Paris it is two years.¹¹⁵

It should be noted that the shortest permissible period is the maximum time period for claims under both the Warsaw and Rome Conventions.¹¹⁶ All of the other time limits are longer than in these two air transport conventions. The consequence of this is obvious: should claims not be made within the time limits in Warsaw and Rome, then the air carrier is released from liability thereunder, and the only action remaining is against the operator of the nuclear installation. On the other hand, if an air carrier

¹¹¹ Standing Committee on Civil Liability for Nuclear Damage, REPORT ON THE SECOND SERIES, 7, Vienna, 23-27 Oct. 1967.

¹¹² It is interesting to note that the United States AEC believes that, should the total claims exceed the amount of private protection and governmental indemnity, then the Federal District Courts could order a concursus of claims and a stay of pending proceeding under Bankruptcy jurisdiction. *Nuclear Liability*, *supra* note 4, at 895.

¹¹³ Vienna Convention, art. VI(1); Paris Convention, art. 8(a); IANEC are the same as Vienna.

¹¹⁴ Vienna Convention, art. VI(2); Paris Convention, art. 8(b); IANEC are identical to Vienna.

¹¹⁵ Vienna Convention, art. VI(3); Paris Convention, art. 8(c); IANEC repeat Vienna.

¹¹⁶ Warsaw Convention, art. 29(1); Rome Convention, art. 21(1).

has paid compensation under the air transport conventions and thereby acquires a recourse action against the operator, it is clear that it would have ample time in which to make its claim under the nuclear liability conventions.

IV. *Conclusion*

The contents of this paper, or perhaps the approach, may convey the impression that air carriers have not fared too well under the nuclear liability conventions. This was not intended. While there appear to be many shortcomings in the conventions which may have adverse consequences for air carriers, most of these can be dealt with by precautionary arrangements prior to the carriage of nuclear goods. In addition, air carriers may stand to gain a great deal from wide acceptance of these treaties. It is important in assessing the conventions to remember that liability problems in connection with the transportation of the sources of nuclear energy and the protection of carriers were not prime objectives of the agreement; rather, the basic purposes seem to have involved protecting innocent third parties from uncontrolled radiation and stimulating the development of nuclear installations in various countries, even at the risk of a major catastrophe. The interests of air carriers were well represented at the many drafting sessions preceding the Paris Convention and at the Diplomatic Conference leading to the Vienna Convention (which serves as the basis of the IANEC Draft Conventions). A perusal of the working papers and preliminary reports which underlay both Paris and Vienna discloses that several provisions which could have been quite adverse to the liability position of air carriers were deleted before the final drafts were completed. In addition to precautions which air carriers may take by express contracts and other means to clarify ambiguous or even onerous provisions, the suggestion has been made that air carriers may wish simply to be designated as operators of nuclear installations where national laws permit. All of the conventions offer this alternative and, in the long run, it may be the best and safest procedure for carriers which are interested in transporting nuclear goods on a large scale after the conventions come into force.